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Polish Patent Specification 103,345

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METHOD OF OBATINING A FUNGICIDAL STAIN FOR IMPREGNATING WOOD

Inventors: Maygorzata Nesteruk
Malgorzate Lypacewicz
Fcyderyl Weigl and
Jerzy Saluda.

Patent Holder: Zjednoczone Zespoly
Gospodarcze sp. z
o.o., Warsaw (Poland)

The object of the invention is a method for obtaining a fungicide oil stain for impregnating wood. The agents used for protecting structural wood can be classified into saline agents and oily agents.

Saline agents are preparations in solid form (powders, crystals), which must be dissolved in water before use. Their composition includes agents that penetrate into wood by diffusion. The staining of the wood occurs with the use of water-soluble dyes that are characterized in general by a low resistance to light and can be easily washed out, which substantially narrows their range of application in construction. There are patents that deal with this subject, e.g., German Patent No. 24,815 and Polish Patent Nos. 36,946 and 42,554.

Oily agents are ready-made preparations in the form of solutions in oils of carbonaceous [sic] or petroleum origin. They are insoluble in water and have protective properties against moisture. They penetrate into wood through the capillary spaces.

Wood preservation, long conducted by covering the surface with paint, had the purpose of protection against moisture and the growth of fungi. However, this method does not induce chemical preservation. After some time, the paint cracks and gaps are formed, through which water comes in contact with the wood. This water has no chance to evaporate and the moisture in the wood quickly exceeds 20%. This results in the danger of fungi formation, warping and cracking of the wood, peeling of the paint and difficulty in repainting without prior removal of the old plain.

Due to the short life and the lack of biological protection of colored paints and lacquers with the usual composition, the so-called external impregnation lacquers containing fungicidal and insecticidal constituents, in which case the toxic constituents penetrate into the wood and the remainder form a pigmented polymerized film on the wood surface began to be used. Inorganic compounds with a high resistance to atmospheric

conditions and ultraviolet and infrared radiation are used as pigments. Such external impregnation lacquers are, for example, agents processed by the U.S. research center Madison-Laboratory (Seifen, Ole-fette 1972, pp. 705-707). One of the recipes can be given as an example, by means of which a cedar color is obtained:

paraffin wax 2.27	4.54 kg
zinc stearate	4.34 kg
painters' naphtha	37.85 kg
boiled linseed oil	113.55 kg
PCP concentrate 10:1	18.93 kg
burnt sienna	4.73 kg (pigment paste)
natural umber	4.73 kg (pigment paste)

The designation of PCP concentrate is usually used in the USA as the commercial mane for a 40% pentachlorophenol solution in an appropriate solvent. External impregnation lacquers do however conceal the natural appearance of the wood surface.

Fungicidal stains are generally currently used that in imparting color to the wood, they do not conceal its structure (grain, knots), vivifying its external appearance. These agents can be classified into superficial and deeply penetrating. The superficial agents include those with which the wood surface is covered after previous impregnation with a primer (with the exception of hard wood, e.g., tropical wood species). They do not provide a pronounced layer on the surface although the depth of pigment penetration dies not exceed 1 mm (Structural Materials, No. 11, November 1983. Royal Process - a new technology).

Agents that penetrate deeply into wood as a function of its composition require impregnation of the wood with a primer or require additional surface protection. The depth of penetration

ranges up to several millimeters. The known colored fungicidal preparations are based primarily on inorganic and organic pigments suspended in an oil solution, with which is associated sedimentation of the pigment and the need for stirring before and during use, and also abrasion of the surface after drying in order to remove the excess pigment.

Polish Patent No. 78,652 indicates the possibility of using aliphatic dyes soluble in organic solvent in the composition of the agent. Aliphatic dyes however have many shortcomings that limit their use. They exhibit a very low resistance to light, are not resistant to atmospheric conditions, many of them change color as a function of the pH of the medium [sic; environment], and are sensitive to heat (sublimation). These properties thus limit the possibility of using this agent only on premises not subject to excessive illumination and not subject to changes in the environmental pH.

The purpose of he invention was to work out a method for obtaining a fungicidal stain characterized by a high coloring stability, photostability and at the same time protecting the wood against moisture and variable atmospheric conditions.

This goal is achieved by using organic-metal complex pigments dissolved in organic solvents, advantageously of the type of chlorinated benzenes, together with the addition of constituents that increase light resistance of the pigment and with a toxic base prepared under the appropriate temperature conditions. Complexes of azo, rhodamine, phthalocyanine and azomethine compounds with metals such as chromium, cobalt, copper or possibly with two metals, e.g., with chromium and copper of type 1:1 or 1:2 are used as the organic pigments according to the invention. Drying resins on the surface, e.g., phthalic resin

modified with linseed oil and/or solid resins, e.g., cyclohexanol resin and/or colophony dissolved in an organic solvent, are used according to the invention as purifying additives that increase the resistance of the pigment to light and the hydrophobicity of the surface of the impregnated wood. Known fungicides and insecticides such as pentachlorophenol, α-chloronaphthalene and methoxychlor are used as the toxic constituents.

By the method according to the invention the organic pigments, which are complexes of azo, rhodamine, phthalocyanine and azomethine compounds with cobalt, chromium and copper, are dispersed in the amount of 0.2-4 wt% of pigment in 1-7 wt% of mineral or vegetable oil and dissolved at a temperature of 20-45°C with intensive stirring in organic solvents, advantageously in chlorinated benzenes, after which they are mixed with a solution, prepared separately at a temperature of 30-75°C, of 2-30 wt% or drying and/or solid resins, e.g., phthalic resin modified with linseed oil and/or colophony and/or cyclohexanol resin in organic solvent, advantageously of the type of chlorinated benzenes, painters' naphtha, xylene and possibly with the addition of mineral oil, and are then combined with the toxic base, e.g., pentchlorophenol, methoxychlor in α-chloronaphthalene or other organic solvent.

The agent obtained by the invention method is clear and homogeneous, does not require additional activities before use such as stirring or shaking, which occur with most agents in which the micronized pigment is in the form of a suspension. The agent induces a uniform coloration of the wood, is characterized by a deep penetration into the wood, in which case the covered wood surface retains its grain pattern (grain and knots) and does

not present any marked difference in color even after damage (scratches and chipping).

The technical parameters of he agent permit its use for impregnating objects exposed to the direct action of atmospheric factors for 2-4 years as a function of the type of pigment, and this time is correspondingly prolonged inside of the objects.

The following examples explain the method of obtaining the agent according to the invention in greater detail.

Example I

0.2 wt% of blue pigment, which is a complex of copper with a phthalocyanine compound, is dispersed in 3 wt% machine oil. The paste obtained is dissolved in 20 wt% of a mixture of chlorinated benzenes with intensive stirring at a temperature of 20-45°C. 10 wt% of phthalic resin modified with linseed oil is dissolved separately in 39.5 wt% of a mixture of chlorinated benzenes and 7 wt% machine oil at a temperature of 30-75°C.

After the temperature is reduced to room temperature, the resin solution is combined under intensive stirring with the staining solution and then with the toxic base, comprised of 4 wt% pentachlorophenol and 16 wt% α-chloronaphthalene.

Example II

0.7 wt% of a mixture in a ratio of 9:1 of yellow pigment, which is a complex of chromium with an azomethine compound, and an orange pigment, which is a complex of chromium with azo compound, is dispersed in 0.3 wt% solar oil. The paste obtained is dissolved in a 20 wt% mixture of chlorinated benzenes with

intensive stirring at a temperature of 20-45°C. 12 wt% of cyclohexanol resin is dissolved separately in a 32 wt% mixture of chlorinated benzenes at a temperature of 35-60°C and 15 wt% naphtha antichlor, 10 wt% xylene and 1 wt% zinc oleate are added. After lowering the temperature to room temperature, the resin solution is combined under intensive stirring with the staining solution and then with the toxic base, comprised of 6 wt% pentachlorophenol and 3 wt% methoxychlor.

Example III

1 wt% of black pigment, which is a complex of chromium with an azo compound, is dispersed in 5 wt% solar oil The paste obtained is dissolved in 25 wt% chlorinated benzenes under intensive stirring at a temperature of 20-45°C. 16 wt% of 50% phthalic resin solution modified by linseed oil is dissolved separately in painters' naphtha, 5 wt% colophony, 17 wt% chlorobenzene and 10 wt% solar oil at a temperature of 40-60°C. After the temperature is lowered to room temperature, the resin solution is combined under intensive stirring with the staining solution and then with the toxic base, composed of 6 wt% pentachlorophenol and 20% chloronaphthalene.

Example IV

1 wt% of a mixture in a ratio of 6:2:2 of orange pigment, which is a complex of chromium with an azo compound, black pigment, which is a complex of chromium with an azo compound, and yellow pigment, which is a complex of chromium with an azomethine compound, is dispersed in 3 wt% linseed oil.

The paste obtained is dissolved in 20 wt% mixture of chlorinated benzenes with intensive stirring at a temperature of 20-45°C. 20 wt% of phthalic resin and 10 wt% of linseed oil are dissolved in 29 wt% painters' naphtha at a temperature of 40-60°C. After lowering the temperature to room temperature, the resin solution is combined under intensive stirring with the staining solution and then with the toxic base, composed of 4 wt% pentachlorophenol and 16 wt% α-chloronaphthalene.

Claim

Method of obtaining a fungicidal staining agent for impregnating wood, characterized in that organic pigments, which are complexes of azo, rhodamine, phthalocyanine and azomethine compounds with cobalt, chromium and copper, in an amount of 0.2-4 wt% of pigment, are dispersed in 1.7 wt% mineral or vegetable oil and dissolved at a temperature of 20-45°C, under intensive stirring, in organic solvents, advantageously in chlorinated benzenes, after which they are mixed with a solution separately prepared at a temperature of 30-75°C of 2-30 wt% drying or solid resins, e.g., phthalic resin modified with linseed oil and/or colophony and/or cyclohexanol resin in organic solvents, advantageously of the type of chlorinated benzenes, painters' naphtha, xylene and with the possible addition of mineral oil, and then combined with the toxic base, e.g., pentachlorophenol and/or methodxychlor in α-chloronaphthalene or other organic solvent.